ACCESSION NR: AP3001485 S/0079/63/033/005/1696/1696

AUTHOR: Shostakovskiy, M. F.; Sokolov, B. A.; Kozlenko, A. I.; Sultangareyev, R. O.; Yermakova, L. T.

TITLE: High temperature condensation of fluorohydrosilanes with chlorobenzene

SOURCE: Zhurnal obshchey khimii, v. 33, no. 5, 1963, 1696

TOPIC TAGS: methylphenyldifluorosilane

ABSTRACT: Methyl difluorohydrosilane was condensed with chlorobenzene at 640 degrees to form methylphenyldifluorosilane.

ASSOCIATION: Irkutskiy institut organicheskoy khimii Siberskogo otdeleniya akademii nauk SSSR (Irkutskiy Institute of Organic Chemistry, Siberian Division, Academy of Sciences, SSSR)

SUBMITTED: 28Dec62 DATE ACQ: 17Jun63 ENCL: 00

SUB CODE: 00 NO REF SOV: 000 OTHER: 000

Card 1/1

L 17535-65 EWT(m)/EPF(c)/EPR/EWP(j) Pc-4/Pr-4/Ps-4 RPL WW/RM
ACCESSION NR: AP4044194 S/0079/64/034/008/2620/2622

AUTHOR: Shostakovskiy, M. F.; Sokolov, B. A.; Koziyenko, A. I.; Yermakova, L. T.; Sultangareyev, R. G.

TITLE: High temperature condensation of chlorosilane hydrides with chloroarylfluoro- and chloroarylchlorosilanes

SOURCE: Zhurnal obshchey khimii, v. 34, no. 8, 1964, 2620-2622

TOPIC TAGS: chloroarylfluorosilane, chloroarylchlorosilane, condensation, high temperature condensation, synthesis

ABSTRACT: The high temperature condensation of chlorosilane hydrides with chloroarylfluorosilanes or chloroarylchlorosilanes, specifically the reactions at 620-640C of trichlorosilane with p-chlorophenyltrifluorosilane or with p-chlorophenyltrichlorosilane, or of methyldichlorosilane with mixtures of m- and o-isomers of chlorophenyltrifluorosilane or with m-, o- and p-isomers (7:2:1 ratio) of chlorophenyltrichlorosilane, was investigated. The chloroarylfluorosilanes

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L 17535-65
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entered the high temperature condensation reaction analgously to the chloroarylchlorosilanes, but the compounds containing the trichlorosilylgroup gave a notably higher yield of condensation products in comparison to compounds containing the trifluorosilyl group. The p-bis(trichlorosilyl)benzene [p-$(Cl_3Si)C_6H_4SiCl_3$] was synthesized more readily from trichlorosilane and p-chlorophenyltrichlorosilane than from trichlorosilane with p-dichlorobenzene. The following novel compounds were synthesized: p-$F_3SiC_6H_4SiCl_3$: m-, o-$[Cl_2(CH_3)Si]C_6H_4SiF_3$; p-$(F_3Si)C_6H_4SiF_3$; m-, o-, p-$[Cl_2(CH_3)Si]C_6H_4SiCl_3$. Orig. art. has: no graphics

ASSOCIATION: None

SUBMITTED: 18Jun63 ENCL: 00

SUB CODE: GC NO REF SOV: 003 OTHER: 002

Card 2/2

L 18282-65 EWT(m)/EPF(c)/EWP(j) Pc-4/Pr-4 RM

ACCESSION NR: AP4046172 S/0079/64/034/009/2839/2842

AUTHOR: Shostakovskiy, M. F.; Sokolov, B. A.; Dmitriyeva, G. V.; Alekseyeva, G. M.

TITLE: The addition reaction of hydrosilanes with vinyl ethers

SOURCE: Zhurnal obshchey khimii, v. 34, no. 9, 1964, 2839-2842

TOPIC TAGS: addition reaction, trichlorosilane, methyldichlorosilane, methyldiethylsilane, vinyl ether, aryl vinyl ether, alkyl vinyl ether, silane addition, siloxane

ABSTRACT: The few existing studies are listed. Addition reactions in the presence of H_2PtCl_6 were studied for trichlorosilane, methyldichlorosilane, methyldiethylsilane and the vinyl ethers of phenol, n-chlorophenol and of 2, 4-dichlorophenol, n-butyl and isobutyl alcohols. The reaction proceeds in 2 directions according to (1) and (2). Synthesis and end products are described.

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ACCESSION NR: AP4046172

$$ROCH{=}CH_2 + HSiR'_nCl_{3-n} \longrightarrow ROCH_2CH_2SiR'_nCl_{3-n} \quad (1)$$

$$ROCH{=}CH_2 + HSiR'_nCl_{3-n} \longrightarrow ROSiR'_nCl_{3-n} + C_2H_4 \quad (2)$$

Spectroscopic investigation of both direct and inverse synthesis showed that the addition of silanes occurs at the beta carbon atom of the vinyl ether. Since intense polymerization results from the interaction of the two reagents, the yield was below 10%. Fourteen siloxanes were obtained. The reactions proceed alike for aryl- and alkyl- vinyl ethers. Hydrolysis of addition products of methyl-dichlorosilane and the various ethers yielded viscous, colorless or yellowish siloxanes with a molecular weight of 500-800. Orig. art. has: 2 formulas

ASSOCIATION: Irkutskiy institut organicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR (Irkutsk Institute of Organic Chemistry, Siberian Department of the Academy of Sciences, SSSR)

SUBMITTED: 20Jun63 ENCL: 00

SUB CODE: GC, OC NO REF SOV: 005 OTHER: 007

Card 2/2

L 18801-65 EPF(c)/EWP(j)/EWT(m) Pc-4/Pr-4 RM
ACCESSION NR: AP4049467 S/0079/64/034/011/3610/3612

AUTHOR: Sokolov, B.A., Grishko, A.N., Lavrova, K.F., Kagan, G.I.

TITLE: Reaction of hydrosilanes with propargyl alcohol

SOURCE: Zhurnal obshchey khimii, v. 34, no. 11, 1964, 3610-3612

TOPIC TAGS: hydrosilane, alkylsilane, propargyl alcohol, silicoorganic compound

ABSTRACT: Mixing propargyl alcohol with methyldiethylsilane in the presence of 0.3 ml 0.1M $H_2PtCl_6 \cdot 6H_2O$ as a catalyst followed by heating at 130C produces γ-(methyldiethylsilyl) allyl alcohol together with an ester, $R'R_2SiCH - CHCH_2OSiR'R_2$ where R is C_2H_5 or C_4H_{10} and R' is CH_3. The same type of reaction occurs when triethylsilane or methyldibutylsilane is added. With methyldiethylsilane, propargyl alcohol forms γ-(methyldiethylsilyl) allyl alcohol, b.p. 74C (2mm), n_D^{20} 1.4596 d_4^{20} 0.8750 and (γ-methyl-diethylsilylallyloxy) methyldiethylsilane, b.p. 90-92C (1.5mm), n_D^{20} 1.4489, d_4^{20} 0.8575. With triethylsilane it forms γ-(triethylsilyl)allyl alcohol,

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L 32217-65 EWT(m)/EPF(c)/T/EWP(j)/EPR Pc-4/Pr-4/Ps-4 RPL WW/GS/RM

ACCESSION NR: AT5002123 S/0000/64/000/000/0140/0144

AUTHOR: Sokolov, B.A.; Khil'ko, O.N.; Shergina, N.I.

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B+1

TITLE: The order of addition of hydrosilanes to phenylacetylene

SOURCE: AN SSSR. Institut neftekhimicheskogo sinteza. Sintez i svoystva monomerov (The synthesis and properties of monomers). Moscow, Izd-vo Nauka, 1964, 140-144

TOPIC TAGS: silicoorganic compound, heterorganic compound, hydrosilane, phenylacetylene

ABSTRACT: The synthesis of $C_6H_5CH = CHSiCl_3$ (boiling. pt. 97C at 9 mm Hg), $C_6H_5CH_2CH(SiCl_3)_2$ (boil. pt. 162C at 8 mm Hg), $C_6H_5CH=CHSi(CH_3)Cl_2$ (b.p. 110C at 4 mm), $C_6H_5CH_2CH[Si(CH_3)Cl_2]_2$ (1-phenyl-2, 2-bis- (methyldichlorosilyl)ethane) (b.p. 162C at 17 mm), $C_6H_5CH=CHSi(C_2H_5)Cl_2$ (β-ethyldichlorosilylstyrene, b.p. 142C at 16 mm), $C_6H_5CH_2CH[Si(C_2H_5)Cl_2]_2$, (b. p. 170C at 10 mm), $C_6H_5CH = CHSi(CH_3)(C_2H_5)Cl$ (b. p. 130C at 7 mm), $C_6H_5CH = CHSi(C_2H_5)_3$ (β-triethylsilylstyrene, b. p. 138C at 10 mm), $C_6H_5CHBrCH_2Si(CH_3)Cl_2$ (b.p. 86C at 2 mm), $C_6H_5CH = CHSi(C_2H_5)F_2$ (β-ethyldifluorosilylstyrene, b. p. 85C at 5 mm), $C_6H_5CH_2CH[Si(C_2H_5)F_2]_2$ (b. p. 110C at 5 mm), and $C_6H_5CH = CHSiF_3$ (b. p. 41C at 1 mm).

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was accomplished, with a yield of 43-85%, by adding one or two molecules of trichloro-, methyldichloro-, ethyldichloro-, methylethylchloro-, and triethylsilane to phenylacetylene in the presence of 0.1 M chloroplatinic acid, according to the reaction:

$$C_6H_5C\equiv CH + R_nSiHCl_{3-n} \xrightarrow{H_2PtCl_6} C_6H_5CH=CHSiR_nCl_{3-n} +$$
$$+ C_6H_5CH_2CH[SiR_nCl_{3-n}]_2,$$

where R is CH_3 or C_2H_5 and n = 0, 1, 2, 3. The hydrosilane molecules were found to add in the cis-position, forming a trans-isomer, contrary to the Markovnikov rule. Hard, vitreous polymers, difficultly soluble in organic solvents, resulted from the addition of one hydrosilane molecule to one phenylacetylene molecule. The recombination scattering spectra, taken with an ISP-51 spectrograph, are supplied for some of the products. Orig. art. has: 1 table and 2 formulas.

ASSOCIATION: none

SUBMITTED: 30Jul64 ENCL: 00 SUB CODE: OC

NO REF SOV: 006 OTHER: 004

Card 2/2

L 32216-65 EWT(m)/EPF(c)/T/EWP(j)/EPR Pc-4/Pr-4/Ps-4 RPL WW/RM

ACCESSION NR: AT5002126 S/0000/64/000/000/0153/0159

AUTHOR: Sokolov, B.A.; Grishko, A.N.; Lavrova, K.F.; Kagan, G.I.

TITLE: Synthesis of fluorosilico-organic monomers

SOURCE: AN SSSR. Institut neftekhimicheskogo sinteza. Sintez i svoystva monomerov (The synthesis and properties of monomers). Moscow, Izd-vo Nauka, 1964, 153-159

TOPIC TAGS: heteroorganic compound, silicoorganic compound, fluorosilico-organic compound, hydrochlorosilane, hydrofluorosilane, chlorosilane, fluorosilane

ABSTRACT: In a 3-part study, the authors first investigated the fluoridation of hydrochlorosilanes by SbF_3, NH_4F, ZnF_2, CoF_2, AgF, and 48% HF in order to determine an effective fluoridizer for the synthesis of hydrofluorosilanes of the type R_nSiHF_{3-n} ($n = 1, 2$) containing Si - H and Si - F bonds. By treating alkyl-(aryl) hydrochlorosilanes with concentrated HF for 30-40 minutes at room temperature, a procedure found to be most effective, a series of fluorinated products was obtained in 60-80% yield; the physical properties of these compounds are tabulated. They then investigated the addition of the hydrofluorosilanes obtained to styrene and allyl chlorides in the presence of 0.1 N H_2PtCl_6 in isopropyl alcohol, in a reaction which may either follow or disobey the Markovnikov rule. This resulted in a series of 12 addition products in

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ACCESSION NR: AT5002126

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4-76% yield. They also investigated the fluoridation of chlorosilanes by the same fluoridizers, resulting in 20 derivatives in yields of 12-88%. The physical properties of all these products are also tabulated. The preparative procedure for several representative products is described in detail and the spectra of some of the products are supplied. The hydrofluorosilanes and 24 of the fluorosilanes are said not to have been previously described in the literature. Orig. art. has: 3 tables and 1 formula.

ASSOCIATION: none

SUBMITTED: 30Jul64 ENCL: 00 SUB CODE: OC

NO REF SOV: 005 OTHER: 009

Card 2/2

SHOSTAKOVSKIY, M.F.; SOKOLOV, B.A.; DMITRIYEVA, G.V.; ALEKSEYEVA, G.M.

Addition of silanes to vinyl ethers. Zhur. ob. khim. 34 no.9: 2839-2842 S '64. (MIRA 17:11)

1. Irkutskiy institut organicheskoy khimii Sibirskogo otdeleniya AN SSSR.

SOKOLOV, B.A.; GRISHKO, A.N.; LAVROVA, K.F.; KAGAN, G.I.

Interaction between silane hydrides and propargyl alcohol.
Zhur. ob. khim. 34 no.11:3610-3612 N '64 (MIRA 18:1)

1. Irkutskiy institut organicheskoy khimii Sibirskogo otdeleniya AN SSSR.

SOKOLOV, B.A., ALEKSEYEVA, G.M.; DMITRIYEVA, G.V.

Organofluosilicon compounds. Part 2: Reaction of silane hydrides with 1-butoxy-1,3-butadiene. Zhur. ob. khim. 35 no.10:1839-1840 O '65. (MIRA 18:10)

1. Irkutskiy institut organicheskoy khimii Sibirskogo otdeleniya AN SSSR.

L 21776-66 EWT(m)/EWP(j) RM

ACC NR: AP6002512 SOURCE CODE: UR/0286/65/000/023/0018/0018

22
B

AUTHORS: Sokolov, B. A.; Grishko, A. N.; Kuznetsova, T. A.

ORG: none

TITLE: A method for obtaining fluorosilicon organic alcohols with conjugated double bonds. Class 12, No. 176584

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 23, 1965, 18

TOPIC TAGS: organosilicon compound, organofluorine compound, conjugated bond system

ABSTRACT: This Author Certificate presents a preparative method for obtaining fluorosilicon organic alcohols with conjugated double bonds by the interaction of fluorohydrosilanes with dialkyl (vinylacetylenyl) carbinols in the presence of chloroplatinic acid.

SUB CODE: 07/ SUBM DATE: 19Oct64

Card 1/1 UDC: 547.419.5.07:541.571.3

ACC NR: AP7006248 SOURCE CODE: UR/0079/67/037/001/0255/0260

AUTHOR: Sokolov, B. A.; Grishko, A. N.; Kuznetsova, T. A.; Kositsyna, E. I.; Zhuk, L. V.

ORG: Irkutsk Polytechnic Institute (Irkutskiy politekhnicheskiy institut); Irkutsk Institute of Organic Chemistry, Siberian Branch, Academy of Sciences, SSSR (Irkutskiy institut organicheskoy khimii Sibirskogo otdeleniya Akademii nauk SSSR)

TITLE: Studies in the area of fluoroorganosilicon compounds. Part 3: Reactions of fluoro- and chlorosilanes with phenylacetylene

SOURCE: Zhurnal obshchey khimii, v. 37, no. 1, 1967, 255-260

TOPIC TAGS: silane, fluorinated organic compound, chlorinated organic compound, organosilicon compound, acetylene compound

ABSTRACT: In order to study further the addition of fluorosilanes to unsaturated organic compounds, particularly acetylenic ones, and also to synthesize alkenylsilanes, the addition of methylpropyl-, methylisobutyl, methylbutylfluorosilanes and also of the corresponding chlorosilanes to phenylacetylene in the presence of Speier's catalyst was carried out. In all cases, the addition was found to form a mixture of α- and β-substituted styrenes:

UDC: 547.245+547.314

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$$C_6H_5C{\equiv}CH + HSiR_1R_2X \rightarrow \begin{cases} C_6H_5C(=CH_2)SiR_1R_2X \\ C_6H_5CH{=}CHSiR_1R_2X \end{cases}$$

X = F, Cl.

The compounds obtained and their yields were: α-methylpropylfluorosilylstyrene (42%), β-methylpropylfluorosilylstyrene (39%), α-methylisobutylfluorosilylstyrene (38%), β-methylisobutylfluorosilylstyrene (32%), α-methylbutylfluorosilylstyrene (48%), β-methylbutylfluorosilylstyrene (30%), α-methylpropylchlorosilylstyrene (25%), β-methylpropylchlorosilylstyrene (45%), α-methylisobutylchlorosilylstyrene, β-methylisobutylchlorosilylstyrene (53%), α-methylbutylchlorosilylstyrene (30%), β-methylbutylchlorosilylstyrene (46%), α-methylisobutylfluorosilylstyrene (95%), β-methylisobutylfluorosilylstyrene, α-methylpropylfluorosilylstyrene, β-methylpropylfluorosilylethylbenzene (92%), β-methylpropylfluorosilylethylbenzene, α-methylisobutylfluorosilylethylbenzene, and β-methylisobutylfluorosilylethylbenzene. IR spectra of all the compounds were recorded. Orig. art. has: 2 figures.

SUB CODE: 07/ SUBM DATE: 15Nov65/ ORIG REF: 008/ OTH REF: 012

Card 2/2

ACC NR: AP7006249 SOURCE CODE: UR/0079/67/037/001/0260/0264

AUTHOR: Sokolov, B. A.; Grishko, A. N.; Kuznetsova, T. A.; Sultangareyev, R. G.

ORG: none

TITLE: Studies in the area of fluoroorganosilicon compounds. Part 4: Synthesis of oxygen-containing fluoroorganosilicon compounds

SOURCE: Zhurnal obshchey khimii, v. 37, no. 1, 1967, 260-264

TOPIC TAGS: vinyl compound, silane, fluorinated organic compound, ether

ABSTRACT: The addition of various fluorosilanes of the general formula $HSiR_1R_2F$ to vinyl isopropyl, vinyl butyl, vinyl isoamyl, vinyl phenyl ether and vinyl ethers of 1,3-dioxolanes in the presence of a 0.1 M solution of chloroplatinic acid in isopropyl alcohol was studied. In all cases except that of vinyl phenyl ether, the addition of fluorosilanes occurs in 80-90% yield according to the reaction

$$R'OCH{=}CH_2 + HSiR_1R_2F \longrightarrow R'OCH_2CH_2SiR_1R_2F$$

In the case of vinyl phenyl ether, the addition according to the above reaction is associated with the formation of $R'OSiR_1R_2F$. The twenty-one new compounds which were synthesized are shown in Tables 1 and 2. Vinyl ethers of 1,3-dioxolanes were kindly

Card 1/4 UDC: 547.245+547.371

Table 1

ACC NR: AP7006249

TABLE 1

Compound	Formula	Yield, %	BP (p, mm)	d_4^{20}	n_D^{20}	MR_D measured	MR_D calculated
iso-$C_3H_7OCH_2CH_2Si(CH_3)(iso\text{-}C_3H_7)F$	$C_9H_{21}FOSi$	86	63° (10)	0.8816	1.4060	53.59	54.02
iso-$C_3H_7OCH_2CH_2Si(CH_3)(C_4H_9)F$	$C_{10}H_{23}FOSi$	90	48 (1)	0.8743	1.4092	58.38	58.66
iso-$C_3H_7OCH_2CH_2Si(CH_3)(iso\text{-}C_5H_{11})F$	$C_{11}H_{25}FOSi$	90	73 (6)	0.8694	1.4132	63.22	63.31
$C_4H_9OCH_2CH_2Si(CH_3)(C_3H_7)F$	$C_{10}H_{23}FOSi$	84	54 (2.5)	0.8779	1.4120	58.41	58.67
$C_4H_9OCH_2CH_2Si(CH_3)(iso\text{-}C_5H_{11})F$	$C_{12}H_{27}FOSi$	90	72 (2)	0.8736	1.4205	67.98	67.96
iso-$C_5H_{11}OCH_2CH_2Si(CH_3)(iso\text{-}C_3H_7)F$	$C_{11}H_{25}FOSi$	98	67 (2)	0.8767	1.4178	63.33	63.31
iso-$C_5H_{11}OCH_2CH_2Si(CH_3)(C_4H_9)F$	$C_{12}H_{27}FOSi$	95	61 (1.5)	0.8742	1.4179	67.44	67.96
iso-$C_5H_{11}OCH_2CH_2Si(CH_3)(iso\text{-}C_5H_{11})F$	$C_{13}H_{29}FOSi$	93	104 (7)	0.8697	1.4212	72.48	72.61
$C_6H_5OCH_2CH_2Si(CH_3)(C_4H_9)F$	$C_{13}H_{21}FOSi$	83	96 (2)	0.9895	1.4810	69.13	69.02
$C_6H_5OCH_2CH_2Si(CH_3)(iso\text{-}C_5H_{11})F$	$C_{16}H_{25}FOSi$	74	110 (3)	0.9807	1.4790	73.56	73.76
$C_6H_5OSi(CH_3)(C_6H_9)F$	$C_{11}H_{15}FOSi$	—	58 (1)	0.9841	1.4840	59.54	59.76
$C_6H_5OSi(CH_3)(iso\text{-}C_5H_{11})F$	$C_{23}H_{23}FOSi$	—	70—71 (1)	0.9806	1.4585	63.17	63.34

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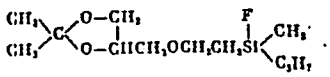
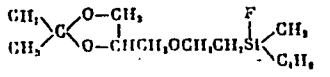
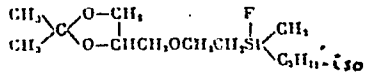
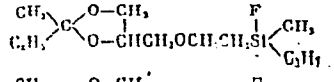
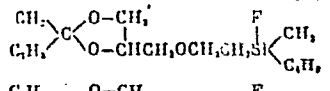
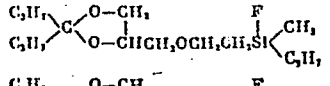
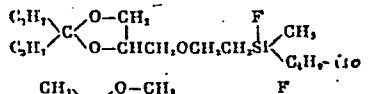
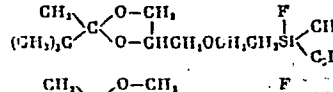
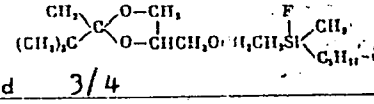
Tab. 2

ACC NR: AP7006249

TABLE 2

Compound	Formula	Yield (%)	BP (p, mm)	d_4^{20}	n_D^{20}	MR_D measured	MR_D calculated
	$C_{12}H_{25}FO_3Si$	87	116—117° (5)	0.9922	1.4282	66.79	66.15
	$C_{13}H_{27}FO_3Si$	88	97 (2)	0.9828	1.4303	73.25	73.80
	$C_{11}H_{29}FO_3Si$	88	105 (1)	0.9730	1.4322	77.95	78.45
	$C_{13}H_{27}FO_3Si$	76	94—97 (1)	0.9870	1.4310	73.82	73.80
	$C_{11}H_{29}FO_3Si$	82	116—117 (3)	0.9798	1.4338	77.70	78.77
	$C_{10}H_{23}FO_3Si$	77	150 (3)	0.9674	1.4378	86.94	87.74
	$C_{17}H_{35}FO_3Si$	84	126—127 (1)	0.9612	1.4386	92.39	91.50
	$C_{15}H_{31}FO_3Si$	77	140 (6)	0.9765	1.4361	82.08	83.09
	$C_{17}H_{35}FO_3Si$	82	126 (1)	0.9641	1.4395	91.36	92.39

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ACC NR: AP7006249

supplied by N. P. Vasil'yev. Orig. art. has: 2 tables.

SUB CODE: 07/ SUBM DATE: 31Jan66/ ORIG REF: 005/ OTH REF: 006

Card 4/4

BROD, I.O.[deceased] VASIL'YEV, V.G.; VYSOTSKIY, I.V.; KRAVCHENKO, K.N.; LEVINSON, V.G.; L'VOV, M.S.; OLENIN, V.B.; SOKOLOV, B.A.; YERSHOV, P.R., ved. red.

[Oil- and gas-bearing basins of the earth] Neftegazonosnye basseiny zemnogo shara. [By] I.O.Brod i dr. Moskva, Nedra, 1965. 597 p. (MIRA 18:3)

SOKOLOV, B.; DZEVANOVSKIY, Yu.N.

Stratigraphic position and age of sedimentary strata of the late Pre-Cambrian. Sov. geol. no.55:31-51 '57. (MLRA 10:6)
(Rocks, Sedimentary) (Geology, Stratigraphic)

OLENIN, V.B.; SOKOLOV, B.A.

Age of the variegated series in Megrelya and eastern Abkhazia.
Izv. vys. ucheb. zav.; geol. i razv. 1 no.8:52-59 Ag '58.
(MIRA 12:9)

1.Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova, Kafedra geologii i geokhimii goryuchikh iskopayemykh.
(Megrelya--Geology, Stratigraphic)
(Abkhazia--Geology, Stratigraphic)

OLENIN, V.B.; SOKOLOV, B.A.

Tectonics, and oil and gas potentials of the Kolkhida Lowland and adjacent areas [with summary in English]. Sov. geol. 2 no.5:96-108 My '59. (MIRA 12:8)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.
(Kolkhida Lowland--Petroleum geology)
(Kolkhida Lowland--Gas, Natural--Geology)

DRUSHCHITS, V.V.; OLENIN, V.B.; SOKOLOV, B.A.; TROKHOVA, A.A.

New data on the lower Cretaceous stratigraphy of central Abkhazia. Izv.vys.ucheb.zav.; geol.i razv. 2 no.8:37-42 '59.
(MIRA 13:4)

1. Moskovskiy gosudarstbennyy universitet.
(Abkhazia--Geology, Stratigraphic)

OLENIN, V.B.; SOKOLOV, B.A.

Western Georgia and the adjacent regions of Krasnodar Territory during the Cretaceous. Izv.vys.ucheb.zav.;geol.i razv. 3 no.2:53-63 F '60. (MIRA 15:5)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Georgia--Geology)
(Krasnodar Territory--Geology)

BELOV, A.A.; DOLGINOV, Ye.A.; KROPACHEV, S.M.; ORLOV, R. Yu.; SOKOLOV, B.A.

Cherkessk-Kelasuri lateral disturbance of the structure of the Greater Caucasus. Izv. AN SSSR. Ser. geol. 24 no.6:24-32 Je '60. (MIRA 14:4)

1. Moskovskiy gosudarstvennyy universitet.
(Caucasus—Geology, Structural)

VAKHANIYA, Ye.K.; OLENIN, V.B.; SOKOLOV, B.A.

Eastern Black Sea oil- and gas-bearing basin. Zakonom. razm. polezn. iskop. 5:549-557 '62. (MIRA 15:12)

1. Trest "Gruzneft'" i Moskovskiy gosudarstvennyy universitet.
(Black Sea region--Petroleum geology)
(Black Sea region--Gas, Natural--Geology)

SOKOLOV, B.A.

A genetic variety of conglomerates. Izv.vys.ucheb.zav.; geol.i razv. 5 no.1:60-61 Ja '62. (MIRA 15:2)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Conglomerate)

OLENIN, V.B.; SOKOLOV, B.A.

World distribution of natural gas. Neftegaz. geol. i geofiz. no.3:50-55 '63. (MIRA 16:8)

1. Moskovskiy gosudarstvennyy universitet.

MUKHANOV, K.K., kand. tekhn. nauk; VASIL'YEV, A.A., inzh.; SOKOLOV, B.B., inzh.; SYCHEV, V.I., inzh.

Effectiveness of using aluminum alloys in constructing walls and roofs of industrial buildings. Prom. stroi. 37 no.7:37-40 Jl '59. (MIRA 12:10)

(Aluminum alloys) (Metallurgical plants)

SOKOLOV, P. D.

Sheep

Using arid and semi-arid pastures for communal sheep-breeding. Sots. sel'.khoz. 23, no. 7, 1952.

USSR / Diseases of Farm Animals. Diseases Caused by Protozoa. R

Abs Jour : Ref Zhur - Biologiya, No 2, 1959, No. 7476

Author : Sokolov, B. D.
Inst : Stavropol Institute of Agriculture
Title : Anaplasmosis in Sheep

Orig Pub : Tr. Stavropol'sk. s.-kh. in-ta, 1956, vyp 7, 375-378

Abstract : No abstract given

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UL'MAN, I.Ye., dots., kand. tekhn. nauk, otv. red.; KHARITONCHIK, Ye.M., prof., otv. za vyp.; Prinimali uchastiye: LEBEDEV, S.P., prof., doktor tekhn. nauk, red.; SERGEYEV, M.P., prof., red.; KUZNETSOVA, A.V., doktor sel'khoz. nauk, red.; MELAMED, V.I., dots., red.; DEULIN, N.P., dots., red.; SOKOLOV, B.F., dots., red.; ROMALIS, B.L., dots., red.; RASKATOVA, Ye.A., dots., red.; TONN, G.A., kand. tekhn. nauk, red.; PANUS, Yu.V., st. prepod., red.; KUBYSHEV, V.A., st. prepod., red.

[Materials of the Jubilee Scientific Conference of the Chelyabinsk Institute of the Mechanization and Electrification of Agriculture] Materialy IUbileinoi nauchnoi konferentsii. Cheliabinsk. Pt.1.[Investigation of the elements of design and the system of agricultural machinery] Issledovanie elementov konstruktsii i sistemy mashin v sel'skokhoziaistvennom proizvodstve. 1962. 122 p. Pt.2.[Improvement in the design of machinery and the means for prolonging their sevice life] Sovershenstvovanie konstruktsii mashin i puti uvelicheniia ikh dolgovechnosti. 1962. 118 p. Pt.3.[New methods for using electric power in mobile units and technological processes in agriculture] Novye sposoby ispol'zovaniia elektricheskoi energii v mobil'nykh agregatakh i tekhnologicheskikh protsessakh sel'skokhoziaistvennogo proizvodstva. 1962. 44 p. (MIRA 16:8)

1. Chelyabinsk. Institut mekhanizatsii i elektrifikatsii sel'skogo khozyaystva.
(Agricultural machinery) (Electricity in agriculture)

S/019/60/000/019/070/102
A152/A029

AUTHORS: Sokolov, B.G.; Glazunov, S.G.; Dobatkin, V.I.; Morozov, Ye.I.

TITLE: An Arc Vacuum Furnace for Smelting Ingots

PERIODICAL: Byulleten' izobreteniy, 1960, No. 19, p. 55

TEXT: Class 40c, 16_{01}. No. 132412 (654506/22 of February 12, 1960). This arc vacuum furnace for smelting ingots with the use of a crystallizer is distinguished by the following special feature: in order to obtain long ingots, the crystallizer is made in the form of sections which close together around the electrode as the ingot is built up.

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S/019/60/000/015/037/091
A152/A029

AUTHORS: Sokolov, B.G., Glazunov, S.G., Zaboronok, G.F., Morozov, Ye.I., Ivanov, A.I. and Khromov, A.M.

TITLE: A Method of Casting Tubes and Hollow Blanks From High-Melting Alloys

PERIODICAL: Byulleten' izobreteniy, 1960, No. 15, p. 47

TEXT: Class 31c, 18 02. No. 130638 (645516/22 of November 27, 1959). This method has the following special feature: to simultaneously melt the charge and form the casting, the charge is introduced into the furnace in accordance with the diameter of the tube. The charge itself constitutes the electrode that goes up in the process of rotation, while a second electrode goes down at the same time.

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SOKOLOV, B.G.

SOV/19-58-4-294/523

AUTHORS: Sokolov, B.G., Glazunov, S.G. and Morozov, Ye.I.

TITLE: A Method of Producing Ingots in Electric Arc Furnaces with Expendable or Non-Expendable Electrodes (Sposob polucheniya slitkov v dugovykh elektropechakh s raskhoduyemym ili neraskhoduyemym elektrodom)

PERIODICAL: Byulleten' izobreteniy, 1958, Nr 4, pp 75-76 (USSR)

ABSTRACT: Class 40a, 46_{50}. Nr 108448 (567122, 23 January 1957). Submitted to the Committee for Inventions and Discoveries at the USSR Council of Ministers. For producing ingots in electric arc furnaces with expendable or non-expendable electrodes, a mutually perpendicular arrangement of the electrode and the crystallizer axes is used when it is in a horizontal position, thus making it possible to move the crystallizer backwards and forwards during the smelting process.

Card 1/1

SOKOLOV, B. G., inzh.; NOVOZHILOV, G. F., inzh.

Means for preventing the freezing of clay to the surface of metal and wood. Stroi. mat. 8 no.9:37-38 S '62. (MIRA 15:10)

(Clay)

SOKOLOV, B.G., inzh.; NOVOZHILOV, G.F., assistent

Laboratory analysis of the action of a special composition preventing the freezing of clays to wood and metal surfaces. Sbor. trud. LIZHT no.203:71-81 '63. (MIRA 18:8)

ZABORONOK, Georgiy Fomich; ZELENTSOV, Tarigan Ivanovich; RONZHIN, Arkadiy Stepanovich; SOKOLOV, Boris Grigor'yevich

[Electron beam melting of metals] Elektronnaia plavka metalla. [By] G.F.Zaboronok i dr. Moskva, Metallurgiia, 1965. 291 p. (MIRA 18:4)

L 10404-66 EWT(d)/EWT(m)/EWP(v)/T/EWP(t)/EWP(k)/EWP(h)/EWP(b)/EWP(l)/EWA(h) UR/60
ACC NR: AM5025342 JD/JW Monograph 51
B+1

Zaboronok, Georgiy Fomich; Zelentsov, Tarigan Ivanovich; Ronzhin, Arkadiy Stepanovich; Sokolov, Boris Grigor'yevich

Electron melting of metal (Elektronnaya plavka metalla) Moscow, Izd-vo "Metallurgiya," 1965. 291 p. illus., biblio. Errata slip inserted. 2700 copies printed.

TOPIC TAGS: metal melting, electron metal melting, electron alloy melting, electron melting unit, electron melting furnace, vacuum equipment

PURPOSE AND COVERAGE: This book is intended for engineering personnel of electrometallurgical plants and machine works, scientific workers of research institutes, and students of metallurgical and engineering schools of higher education. The book presents copious information on electron-beam melting units, vacuum installations, focusing of electron beams, and the properties of metals obtained by electron-beam melting. The theory of physicochemical processes involved in electron melting are also discussed.

TABLE OF CONTENTS:

Card 1/4 UDC: 621.3.032.269.1

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L 10404-66
ACC NR: AM5025342

SUB CODE: MM/ SUBM DATE: 18Dec64/ ORIG REF: 067/ OTH REF: 064

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SOKOLOV, B.G.

Time and odometer. Avt. prom. 28 no.7:35-37 Jl '62. (MIRA 16:6)

1. Gosudarstvennyy soyuznyy ordena Trudovogo Krasnogo Znameni nauchno-issledovatel'skiy avtomobil'nyy i avtomotornyy institut.
(Automobiles)

SOKOLOV, Boris Ivanovich; MIKHAYLOVA, Ye.N., red.; UMANSKIY, P., tekhn.red.

[Supplying water to pastures in deserts] Obvodnenie pastbishch pustyn'. Tashkent, Gos.izd-vo Uzbekskoi SSR, 1958. 410 p. (MIRA 12:5)

(Water supply, Rural) (Pastures and meadows) (Irrigation)

Sokolov, B. I.

AUTHOR: Sokolov, B.I., Candidate of Technical Sciences 99-58-4-4/7

TITLE: The Utilization of Sub-Soil Water in Uzbekistan (Ispol'zovaniye podzemnykh vod v Uzbekistane)

PERIODICAL: Gidrotekhnika i Melioratsiya, 1958, # 4, pp 41-46 (USSR)

ABSTRACT: Sub-soil water was not widely used for irrigation in either Uzbekistan or other republics, as river water sufficed for this purpose, and the use of electric pumps was regarded as too expensive. In several rayons, year-round irrigation by means of canals caused a rise in the level of ground waters and created saline and marshy soil conditions. Subsoil-water is much more controllable. The use of this sub-soil water in the irrigation of many oases of the type of Zeravshan (in Samarkand and Bukhara Oblasts) is important as these regions often suffer from shortages of river water. The reserve of sub-soil water in irrigated oases is very important, and there are possibilities to use it in the Fergana Valley, in the Tashkent and Bukhara Oblast's, as well as in other regions. The Fergana valley, geologically, was especially favorable for the accumulation of large reserves of artesian water. During the last years large areas of this Valley have been

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SOKOLOV, B.I.

Irrigating pastures and providing watering points for livestock during the sixth five-year plan. Izv.AN Uz.SSR no.8:13-27 '56. (MIRA 12:7)
N '58.
(Uzbekistan--Water supply, Rural)
(Pastures and meadows)

ACC NR.: AP6029942

these is proportional to the amplitude of the output signal, and the other varies with the phase of signal relative to the phase of the supply voltage, thus limiting the transmission region of the output signal of the defectoscope.

SUB CODE:11,13/ SUBM DATE: 16Nov61

Card 2/2

MARTYNOV, F.A., mashinist tepleveza; SOKOLOV, B.I., mashinist tepleveza; YEVSEYEV, A.G., mashinist teplevoza; VASILENKO, V.I., mashinist teplevoza; LAUKHIN, T.A., mashinist tepleveza

We shall raise the monthly productivity for diesel locomotives to 40 million tkm. Elek. i tepl. tiaga 2 no.11:5 N '58. (MIRA 11:12)

1.Depo Liski Yugo-Vostochnoy deregi.
(Liski--Diesel Locomotives)

SOKOLOV, B.I., inzhener.

Sinking shaft wells by using concrete grid bracing. Gidr.i mel. 5 no.5: 22-27 My '53. (MLRA 6:6) (Wells)

Sokolov, B. I.

5

Continuous-operating rectification columns for alcohol. B. I. Sokolov and A. I. Levchik (Alcohol Plant, Pis-[illegible]). *Spirtovaya Prom.* 21, No. 4, 30-1(1955).—By periodically discarding the ether-aldehyde fraction in the continuous rectification of alc. (*ibid.* 19, No. 1, 33(1953)), the EtOH could be improved to contain only 27 mg. esters/l. and 0.01% or less aldehydes and fusel oil. W. L.

SOKOLOV, B.I.

GRYAZNOV, V.P.:SOKOLOV, B.I.

Rectification of crude molasses alcohol at the Kaluga Liqueur and Vodka Plant. Spirt. prom. 23 no.2:24-25 '57. (MLRA 10:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut spirtovoy promyshlennosti. (for Gryaznov). 2. Rosglavspirt (for Sokolov)
(Alcohol)

GLOBUS, L.L.; SOKOLOV, I.G.; SOKOLOV, B.I.; LUGOVKINA, Ye.I.; GURVICH, E.A., red.; KASIMOV, D.Ya., tekhn. red.

[Manufacture of nonmetallic building materials] Proizvodstvo nerudnykh stroitel'nykh materialov. Moskva, Gosstroiizdat, 1963. 175 p. (MIRA 17:2)

1. Gosudarstvennyy soyuznyy institut po proyektirovaniyu nemetallorudnoy promyshlennosti.

SHCHERBAN', Ye.F. [Shcherban', IE.F.]; SOKOLOV, B.I.; GRIGORYAN, F.L. [Hryhorian, F.L.]

Using the card spinning system for processing polyacrylonitrile "prelan" fibers. Leh.prom. no.3:66-71 Jl-S '63. (MIRA 16:11)

1. Ukrainskiy nauchno-issledovatel'skiy institut po pererabotke iskusstvennogo i sinteticheskogo volokna.

SOKOLOV, B.I.

Manufacture of mixed lavsan-viscose fibers on cotton spinning machinery. Leh. prom. no.2:12-15 Ap-Je '64 (MIRA 17:7)

SOKOLOV, B.I.

Processing of capron and lavsan fibers with the equipment for cotton manufacture. Leh. prom. no.3:43-46 Jl-S '65. (MIRA 18:9)

SOKOLOW, B.T., Engr.

Selection of bus lines for small substations. Energetik. 13 no.4:19-20 Ap '65. (MIRA 18:6)

GUSEVA, L.M.; SOKOLOV, B.K.; KRASIN, A.G.; LYSENKO, A.M.; MOROZOV, G.A., red.

[For high corn yields] Za vysokie urozhai kukuruzy. Novgorod, Knizhnaia red.gazety "Novgorodskaia pravda," 1960. 59 p. (MIRA 14:12)

(Corn (Maize))

SOKOLOV, B.K., inzh.

Methods of studying the wear of marine diesels. Trudy LIVT no.60:3-14 '64 (MIRA 18:2)

AUTHORS: Sokolov, B. K. and Sadovskiy, V. D. SOV/126-6-3-27/32

TITLE: On the Formation of Austenite During Heating of Steel by Reverse Martensitic Transformation (Otnositel'no obrazovaniya austenita pri nagreve staley putem obratnogo martensitnogo prevrashcheniya)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 3, pp 568-569 (USSR)

ABSTRACT: In an earlier paper (Ref 1) metallographic proof is given on the possibility of two mechanisms of the formation of austenite during heating of hardened engineering alloy steel. In the same way, as during decomposition of super-cooled austenite, a diffusion mechanism of phase recrystallisation (pearlite-troostite decomposition) and diffusionless martensite transformation are possible. Austenite formation can also be brought about by diffusion interaction of ferrite and carbides or by a non-diffusion process similar to the reversible martensite transformation. However, the proofs given in the earlier work (Ref.1) of the existence of a non-diffusional formation of austenite in steel are not exhaustive. Direct observation of the non-diffusional formation of austenite can be

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On the Formation of Austenite During Heating of Steel by Reverse Martensitic Transformation

effected by a vacuum metallography method described by M. G. Lozinskiy (Ref 2). The non-diffusional transformation of the martensitic type, which is associated with maintenance of coherence during the growth of the new phase is always accompanied by the formation of a relief on the polished surface of the specimen (Ref 3). This is due to the fact that during such a transformation the atoms can shift only in certain directions relative to their neighbours. As a result of such insignificant individual shifts of the atoms large collective displacement of a macroscopic order will result. The latter lead to the formation of a relief on the polished surface. Thus, in the case of martensitic transformation a clear "acicular" relief will occur. T. Ko and S. A. Cottrell (Ref 4) observed the formation of a relief during bainite transformation and this led to the assumption that the formation of bainite is also based on non-diffusional transformation. The occurrence on the polished specimen surface of a relief during heating should indicate that the formation of the austenite is

On the Formation of Austenite During Heating of Steel by Reverse Martensitic Transformation

according to the non-diffusional mechanism. For obtaining a structure of coarse acicular martensite, steel 40KhGS was quenched from 1300°C and from this steel specimens 10 x 4 x 55 mm were produced, which were heated in a vacuum metallography device (Ref 2) at a rate of 50°C/sec. At temperatures of the order of 700°C a relief appeared on the surface, a photo of which is reproduced in Fig. 1. The formation of this relief proceeded at a high speed and almost simultaneously on a number of grains. The relief had an acicular character which indicates that the formation of austenite under these conditions is by the non-diffusional process similar to the reversible martensitic transformation. In specimens tempered prior to heating (at 600°C for two hours) no relief was obtained under equal conditions. Obviously, the diffusion mechanism of austenite formation is caused by the preliminary tempering of the steel

SOV/126-6-3-27/32

On the Formation of Austenite During Heating of Steel by Reverse Martensitic Transformation

prior to heating.
There are 1 figure and 4 references, 3 of which are Soviet, 1 English.

(Note: This is a complete translation)

ASSOCIATION: Institut fiziki metallov Ural'skogo filiala AN SSSR (Institute of Metal Physics, Ural Branch of the Ac.Sc., USSR)

SUBMITTED: January 29, 1958

1. Steel--Phase studies 2. Austenite--Develppment 3. Diffusion --Applications 4. Martensite--Transformations

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SOV/137-59-3-6413

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 3, p 211 (USSR)

AUTHORS: Sadovskiy, V. D., Sokolov, B. K.

TITLE: The Effect of Phosphorus Content on the Notch Toughness of Cr-Ni and Cr-Ni-Mo Steels (Vliyaniye soderzhaniya fosfora na udarnuyu vyazkost' khromonikelevykh i khromonikel'molibdenovykh staley)

PERIODICAL: Tr. Ural'skogo politekhn. in-ta, 1958, Nr 68, pp 45-53

ABSTRACT: The effect of P content on the a_k values of two types of steel was investigated after quenching and tempering at various temperatures. The composition of the steel was as follows: 1) 0.25-0.27% C, 0.26-0.32% Si, 0.40-0.51% Mn, 2.91-3.1% Cr, 1.00-1.06% Ni, and 0.024-0.110% P; 2) 0.27-0.28% C, 0.21-0.33% Si, 0.39-0.43% Mn, 2.95-3.06% Cr, 0.98-1.04% Ni, 0.35-0.42% Mo, and 0.022-0.160% P. It was established that as the P content of these steels is increased, an over-all reduction in the value of a_k is observed after tempering at temperatures ranging from 20 to 675°C; this is accompanied by an increase in the susceptibility to temper brittleness (TB) and a reduction in the value of a_k during additional low tempering after refining anneal. The adverse influence of P on the a_k value is

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The Effect of Phosphorus Content on the Notch Toughness of Cr-Ni (cont.)

attributable to the fact that P aggravates the susceptibility of the steels to reverse TB and, as its concentration is increased, extends the temperature range of TB down to room temperature. Bibliography: 8 references.

I. B.

SOV/129-59-5-2/17

AUTHORS: Engineer B.K. Sokolov; Dr. Tech. Sc. Prof. B.D. Sadovskiy

TITLE: On the Structural Mechanism of Formation of Austenite during Heating of Steels (O strukturnom mekhanizme obrazovaniya austenita pri nagreve staley)

PERIODICAL: Metallovedeniye i Termicheskaya Obrabotka Metallov, 1959, Nr 5, pp 7-14 + 1 plate (USSR)

ABSTRACT: In earlier work of the authors and their team (Refs 1-6), it was shown that as a result of slow heating of previously over-heated and hardened steel austenitic grains are formed in the process of phase recrystallization which correspond in size and shape to the original austenite. Increase of the hardening speed in the range of phase transformations leads to the formation of fine austenitic grain which has a preferential crystallographic orientation within the limits of the original grain. The authors suggest that such crystallographic ordering should be called the secondary intra-granular texture. Disturbance of the order takes place during heating to higher temperatures and this is obviously due to recrystallisation of the austenite caused by phase hardening. In increasing further the heating speed and

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On the Structural Mechanism of Formation of Austenite during Heating of Steels

changing over to very high heating speeds the formation is again observed of austenite grains corresponding in size and shape with the large original grains, which break up during subsequent increases in temperature. In the here-described work the authors studied the structures which are associated with the formation of austenite in steels at various heating rates. The investigations were carried out on low alloy steels with chemical compositions as entered in Table 1 (p 7). Rods of the steel 40KhGS were heated to 1300°C, held for 2 hours at that temperature, and quenched in oil. The structure of the specimens prepared from these rods consisted of coarse lamellar martensite. The specimens were heated with a pre-determined speed to the appropriate temperature and after holding them at that temperature for the necessary time they were quenched in water. Vacuum metallography techniques were used for direct observation of the structural change at elevated temperatures. The grain boundaries were etched with a solution of picric acid in xylol after tempering the specimens in the range of temperatures where temper

On the Structural Mechanism of Formation of Austenite during Heating of Steels

brittleness develops. The existence of an intragranular texture was established visually from the selective shine of the microstructure and of the fractured specimen and also by means of X-ray structural analysis. The following were investigated: influence of the speed of heating in the range of phase recrystallization on the dimensions of the austenitic grains (Fig 1, plate); structural mechanism of re-establishment of the austenite grain during slow heating (Fig 2); structural mechanism of re-establishment of the original grain during rapid heating of non-tempered steel; structural mechanism of obtaining a fine austenitic grain during heating at intermediate speeds (Fig 3); influence of the chemical composition of steel. On the basis of the obtained results the authors conclude that: (1) when heating steels which have a crystallographically ordered initial structure (martensite) the influence of the speed of heating manifests itself in a very pronounced manner on the structure of the forming austenite. (2) In the case of slow heating the initial austenitic grain recovers and during phase transformation process the formation can be

On the Structural Mechanism of Formation of Austenite during Heating of Steels

observed of numerous austenite centres. The recovery can be explained by the crystallographic correspondence between the occurring austenite germinations and the initial structure. (3) A very rapid heating of hardened steel also leads to the re-establishment of the dimensions of the original austenite grain and this is attributed to the "diffusionless" mechanism of austenite formation. (4) On heating steel at intermediate speeds a fine grain austenite structure is observed. The dimensions of the initial austenite grain will be the smaller, the shorter the time of passage through the critical temperature range. The dimensions of the grain will not be determined by the total number of the forming austenite centres but only by the quantity of some of them. This can be explained on the basis of assuming the formation of a metastable austenite. (5) The here-indicated character of the influence of the speed of heating on the structure of the

On the Structural Mechanism of Formation of Austenite during Heating of Steels

produced austenite is valid for a considerable number of steels.
There are 4 figures, 2 tables and 14 references, 13 of which are Soviet and 1 German.

ASSOCIATION: Institut Fiziki Metallov AN SSSR (Institute of Metal Physics, Ac. Sc. USSR)

S/520/59/000/022/018/021
E111/E452

AUTHORS: Sokolov, B.K. and Gorbach, V.G.

TITLE: Diffusionless Formation of Austenite During Heating of Hardened Steel

PERIODICAL: Akademiya nauk SSSR. Ural'skiy filial, Sverdlovsk. Institut fiziki metallov. Trudy, No.22,1959,pp.123-135

TEXT: A typical example of a diffusionless process is the martensite transformation, studied in detail by S.S.Shteynberg (Ref.2), G.V.Kurdyumov (Ref.3) and V.N.Gridnev (Ref.4). The reverse martensite transformation (Ref.5,6,7) is a further example of a diffusionless process of the martensite type (Ref.8). Opinions differ on the possibility of the process at higher temperatures, particularly in the heating of steel. Gridnev (Ref.8) considers correct crystallographic orientation of the structure an important requirement; the process is also promoted by alloying of the solid solution (Ref.9,10) and rapid heating (Ref.11, 12). Theoretically the diffusionless process is quite possible with steels (Ref.13,14,8) but experimental proof consists in the observed decrease in the phase-transformation temperature at high heating rates (Ref.15). The present authors doubt the

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sufficiency of the experimental proof: I.N.Kidin (Ref.16) has explained the effect for pure iron without reference to diffusionless austenite-formation. Texture formation favours the diffusionless transformation idea (Ref.6,7,17). In the present work, the possibility of diffusionless austenite formation during heating of an iron-nickel alloy and steels was investigated

	Steel	C	Mn	Si	Ni	Cr	S	P
1	Iron-nickel alloy	0.05	0.16	0.29	27.8			
2	40H19G (40N19G)	0.39	1.10	0.15	19.3	0.19		
3	40X12 (40Kh12)	0.42	0.23	0.32	0.17	12.22	0.02	0.027
4	40XГС (40KhGS)	0.40	0.86	1.12	0.15	1.06		

A coarse grain was produced by heating rods to 1300°C, holding for 2 hours and quenching. 55 x 10 x 3 mm specimens were then ground from the rods. Vacuum metallography (Ref.19), with heating at rates up to 500°C/sec and cooling in a vacuum, was used for direct observation of structural changes during heating. For quenching specimens in water, the apparatus described by N.M.Rodigin (Ref.20) was used. Grain boundaries in 40Kh12 and 40KhGS steels were

revealed by etching (Ref.21) or the troostite network. The results with the iron-nickel alloy confirmed previous investigations by G.V.Kurdyumov, V.N.Gridnev, Ya.M.Golovchiner and G.Vasserman (Ref.1,5,18,22) but also showed a new feature: several austenite plates are formed on one martensite plate during the reverse transformation. On rapid heating of the hardened steels, relief appears very rapidly on the polished section where there are martensite plates. The appearance of relief in the alpha martensite → gamma transformation indicates that it occurs via a crystallographically ordered path of the reverse martensite transformation type. Another result of rapid heating is that the original grain is restored during phase recrystallization. This is due to the reversibility of crystallographic orientations in the direct and reverse diffusionless transformation. Tempering or slow heating of hardened steels leads to austenite formation with diffusion. Relief is then absent, an array of metallographically independent austenite grains being formed at the location of each original grain. The work indicates that in the rapidly heated steels, austenite is formed by a mechanism (probably diffusionless) different from that of the normal diffusion transformation.

Diffusionless Formation of ...

Acknowledgments are expressed to V.D.Sadovskiy who made suggestions and contributed to the discussion of this work. There are 7 figures, 1 table and 26 references: 24 Soviet and 2 non-Soviet.

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S/126/60/009/01/005/031
E111/E191

AUTHORS: Varskaya, A.K., Kompaneytsev, N.A., Sokolov, B.K., and Sadovskiy, V.D.

TITLE: X-Ray Investigation of Phase Recrystallization during Heating of Steel

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 1, pp 28-30 (USSR)

ABSTRACT: It has been reported (Refs 1, 2) that metallographic investigation of phase recrystallization during heating of some structural alloy steels, which have in their initial state a crystallographically ordered structure of martensite or bainite, showed that heating rates influence austenite structure formed above Ac_3. The object of the present investigation was to check this effect by X-ray diffraction and also the reported (Ref 3) existence of intragranular texture in the austenite at intermediate heating rates. An axial camera with unfiltered iron radiation was used, with a special holder to ensure that the same spot was photographed before and after the selected heat treatment. Commercial steels type 40KhS, 35KhGS and 37KhN3A previously hardened from 1300 °C were used; parallel

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S/126/60/009/01/005/031
E111/E191

X-Ray Investigation of Phase Recrystallization during Heating of Steel

tests were made on the same steels in the cast state (hardened immediately after solidification). Slow-heating was effected in vacuum. With slow-heating directly above Ac_3 all the original texture maxima are reproduced in the X-ray diagrams (Fig 1 a-6), but new orientation appears if the heating is at 50-80 °C and more above Ac_3. Very rapid heating of untempered steel similarly restores (above Ac_3) the original grain with slightly redistributed orientations (Fig 2 a-6) and the texture disappears if the temperature is high enough for austenite recrystallization. With intermediate heating rates the austenite grains obtained above Ac_3 are generally considerably finer than originally and have a different and weaker texture (Fig 3 a-6), the same effect being obtained with very rapid heating of tempered specimens. At temperatures of 1100 °C and over texture disappears. This work was reported at the VI Vsesoyuznoye nauchno-tekhnicheskoye soveshchaniye po primeneniyu rentgenovskikh luchey k issledovaniyu materialov (All-Union Scientific-Technical Conference on

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S/126/60/009/01/005/031
E111/E191

X-Ray Investigation of Phase Recrystallization during Heating of Steel

the Use of X-rays for Materials Testing), June 24, 1958.

There are 3 figures and 5 Soviet references.

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Physics of Metals, Acad.Sci. USSR)

SUBMITTED July 25, 1959

Card 3/3

S/126/60/009/03/026/033
E111/E452

AUTHORS: Sadovskiy, V.D. and Sokolov, B.K.

TITLE: On the Possibility of Diffusionless Formation of Austenite During the Heating of Steel

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 3, pp 463-465 (USSR)

ABSTRACT: The authors reply to criticism by V.N.L'nyanoy and I.V.Salli (pp 461-463 of this issue) of their contention that diffusionless formation of austenite can occur during rapid heating of hardened steel. They state that the disappearance of relief in the reverse transformation, considered a necessary consequence of the diffusionless reverse transformation by L'nyanoy and Salli, does not apply to the normal reverse transformation associated with temperature hysteresis. They give photomicrographs of the same specimen of nickel (27.8%) iron after direct (Fig 1a) and reverse (Fig 1b) martensite transformation, where the diffusionless mechanism is established (Ref 2,3). The relief found to appear at relatively slow (200°C per minute) heating rates the authors attribute to volume

Card 1/2

GORBACH, V.G., kand.tekhn.nauk; SOKOLOV, B.K., inzh.

Transformations during steel heating. Metalloved. i term. obr. met. no.6:42-44 Je '61. (MIRA 14:6)

1. Institut fiziki metallov AN SSSR.
(Steel--Metallography)
(Crystallization)

S/126/62/014/003/010/022
E111/E435

AUTHORS: Sadovskiy, V.D., Bogacheva, G.N., Sokolov, B.K.

TITLE: Structural mechanism of phase transformations in the heating of steel

PERIODICAL: Fizika metallov i metallovedeniye, v.14, no.3, 1962, 414-421

TEXT: The authors consider some general problems relevant to the structural mechanism of phase overcrystallization (defined by the author as "the process or combination of processes causing each single-crystal grain (crystallite) to break up into several new, randomly orientated grains") during heating of steel. The experimentally observed dependence of Ac3 on heating rate is explained by the change in the structural mechanism of the austenite-formation process. As the rate increases the homogeneous mechanism gives way to a heterogeneous mechanism in which solution of excess ferrite in austenite is accelerated through increased surface diffusion. An important part is played by the appearance of moving non-coherent boundaries: when they are present the austenization is heterogeneous and vice versa.

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With steel the homogeneous variant does not exclude the possible existence of moving boundaries at higher temperatures. For instance, with titanium or aluminium bronze the alpha ⟶ beta transformation occurring by the homogeneous mechanism does not lead to overcrystallization at temperatures right up to the melting point. The behaviour of Ti may be the "normal" behaviour. However, it is also possible that all cases of transformations accompanied by overcrystallization include the recrystallization effect. The authors emphasize that their approach needs further development but suggest that it provides a common basis for considering processes which at the first glance appear to be different. There are 8 figures.

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Physics of Metals AS USSR)

SUBMITTED: May 6, 1962

Sokolov, B. K.

AID Nr. 982-6 4 June

EFFECT OF HIGH HYDROSTATIC PRESSURE ON PHASE TRANSFORMATIONS IN Fe-Ni ALLOYS (USSR)

Mel'nikov, L. A., B. K. Sokolov, and A. I. Stregulin. Fizika metallov i metallovedeniye, v. 15, no. 3, Mar 1963, 357-361.

S/126/63/015/003/006/025

The effect of hydrostatic pressure on the direct and reverse martensitic transformation in the Fe-Ni alloy containing 0.046% C and 27.6% Ni has been studied by the Institute of the Physics of Metals, Academy of Sciences USSR. Disk-shaped alloy specimens 4.5 mm in diameter and 0.5 mm thick were vacuum annealed at 1150°C for 1 hr and water quenched. It was found that a pressure of 10,000 kg/cm^2 lowers the M_s temperature to -50°C, compared with 3°C under atmospheric pressure, and reduces the rate of transformation. Under atmospheric pressure 80% of the austenite transforms to martensite between +3° and -20°C. Under 10,000 kg/cm^2 the same percentage transforms between -50° and -100°C. High pressure also lowers the temperature of the beginning of the reverse transformation. At 10,000, 20,000 and 30,000 kg/cm^2 the A_s temperatures were found to be 435°, 400°, and 360°C, respectively, compared with 465°C under atmospheric pressure. [ND]

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NEKRASOVA, M.I.; SOKOLOV, B.K.

Concerning the method of transformer steel film pickling. Fiz. met. i metalloved. 16 no.1:149-151 Jl '63. (MIRA 16:9)

1. Verkh-Isetskiy metallurgicheskiy zavod i Institut fiziki metallov AN SSSR.

(Steel--Pickling)

NOSKOVA, N.I.; SADOVSKIY, V.D.; SOKOLOV, B.K.; TOMILOV, G.S.

Control of strain hardened steel articles by coercive force measurements. Zav.lab. 29 no.7:819-821 '63. (MIRA 16:8)

1. Institut fiziki metallov AN SSSR.
(Steel--Testing)

ACCESSION NR: AP4017372 S/0126/64/017/002/0313/0315

AUTHORS: Mel'nikov, L. A.; Sokolov, B. K.; Stregulin, A. I.

TITLE: Plastic deformation effect on the reverse martensite transformation in nickel iron

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 2, 1964, 313-315

TOPIC TAGS: Ni, Fe, nickel iron, plastic deformation, phase transformation, direct transformation, reverse transformation, martensite deformation, austenite deformation, deformation temperature effect, nickel iron deformation

ABSTRACT: The plastic deformation effect of martensite in Ni-iron on the reverse transformation was studied in order to obtain additional information concerning this process. Ingots containing 27.6% Ni and 0.046% carbon, were held at 1200C for 10 hours and were then forged into samples 0.5 mm thick and 4.5 mm in diameter. These samples were vacuum heated to 1150C, held at that temperature for one hour, and cooled in water. The martensite transformation started at 2°, and the reverse transformation (martensite to austenite) at 465C. In order to obtain a maximum quantity of martensite, the samples were cooled in liquid nitrogen. After this

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ACCESSION NR: AP4017372

they were worked in a hydraulic press. It was established that the deformation of martensite at various temperatures affected in different ways the reverse martensite transformation. It caused the formation of austenite when induced at the A_H temperature (temperature of the beginning of the reverse transformation), and it delayed the transformation when applied at temperatures lower than A_H (in such cases, it was necessary to heat the samples in order to start the formation of austenite). The plastic deformation had the same effect on the martensite transformation during cooling. Deforming the alloy in the austenite state at temperatures exceeding M_H (temperature of the beginning of martensite transformation) activated the martensite transformation and increased the temperature of the beginning of martensite formation. This activation effect was weakened by the increase in the deformation temperature and was eventually replaced by slowing down of the martensite transformation (i.e., by the austenite stabilization effect). The authors believe that the results of these experiments justify the assumption that the causes of the plastic deformation effect on direct and on the reverse martensite transformation may be the same. Orig. art. has: 2 figures.

Card 2/3

ACCESSION NR: AP4017372

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physical Metallurgy AN SSSR)

SUBMITTED: 30Jul63 DATE ACQ: 18Mar64 ENCL: 00

SUB CODE: ML NO REF SOV: 005 OTHER: 002

Card 3/3

ACCESSION NR: AP4039605 S/0126/64/017/005/0769/0772

AUTHORS: Mel'nikov, L. A.; Sokolov, B. K.; Stregulin, A. I.

TITLE: High pressure effect on ShKh15 steel transition during annealing

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 5, 1964, 769-772

TOPIC TAGS: steel transition, annealing, carbon, chromium, magnesium, coercive force, atmospheric pressure, carbide, residual austenite, martensite, steel ShKh15

ABSTRACT: The pressure effect on the transition of steel ShKh15 (containing 1.3% carbon, 1.46% chromium, and 0.3% magnesium) during annealing was studied. A 3-mm. diameter by 25 mm specimen was quenched in NaOH water solution after being vacuum heated to 1000C. Annealing was carried out under 20 000 kg/cm^2 pressures at 75-300C temperatures applied for 30 min. The coercive force H_c was measured as a function of temperature. The curves showed an identical decay of H_c under both 20 000 kg/cm^2 and under atmospheric pressures for $200 \leq T \leq 300$C. Curves of H_c versus T after annealing indicate ε-carbide to χ-carbide transitions activated by the pressure. Measurements of residual austenite indicate that at low annealing temperatures the martensite decay proceeds at the same rate under both high and atmospheric pressures, but the presence of high pressure delays the decay of residual austenite.

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ACCESSION NR: AP4039605

V. P. Katayev participated in this work. Orig. art. has: 6 figures and 1 table.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physical Metallurgy AN SSSR)

SUBMITTED: 18Jul63 DATE ACQ: 19Jun64 ENCL: 00

SUB CODE: MM NO REF SOV: 002 OTHER: 004

Card 2/2

MEL'NIKOV, L.A.; [illegible], B.K.; [illegible], L.[illegible].

Effect of high pressures on transformations during the tempering of ShKh15 steel. Fiz. met. i metallovед. 17 no.5:769-772 My '64. (MIRA 17:9)

1. Institut fiziki metallov AN SSSR.

L 13998-65 EWT(m)/EPF(c)/EPR/EWP(j) Pc-4/Pr-4/Ps-4 AEDC(a)/SSD/AFWL/AFTC(p)
RM/WW
ACCESSION NR: AP4046478 S/0032/64/030/010/1284/1284

AUTHOR: Mel'nikov, L. A.; Sokolov, B. K.; Stregulin, A. I.

TITLE: High-pressure chamber for the study of phase transfer

SOURCE: Zavodskaya laboratoriya, v. 30, no. 10, 1964, 1284

TOPIC TAGS: hydrostatic pressure, ultrahigh pressure, steel treatment

ABSTRACT: A high-pressure chamber has been designed in which steel specimens can be heated up to 400C under hydrostatic pressures up to 30,000 kg/cm^2. The chamber (see Fig. 1 of the Enclosure) consists of heavy steel housing 6, with nephrite bushing 5, into which steel specimen 1, enclosed in teflon envelope 4, is placed. When the temperature inside the nephrite bushing is raised by heater 2, the teflon melts and serves as a medium for the transfer of the pressure from plungers 7 and 8, which are actuated by a hydraulic press. The temperature of the specimen is measured by thermocouple 2 welded to it. The chamber has successfully withstood over 50 tests in which annealed and quenched steel specimens were tempered at 75—350C under a 23,000 kg/cm^2 pressure. Orig. art. has: 1 figure.

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L 13998-65
ACCESSION NR: AP4046478

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals, AN SSSR)

SUBMITTED: 00 ENCL: 01 SUB CODE: MM

NO REF SOV: 000 OTHER: 000 ATD PRESS: 3137

Card 2/3

L 13998-65
ACCESSION NR: AP4046478

ENCLOSURE: 01

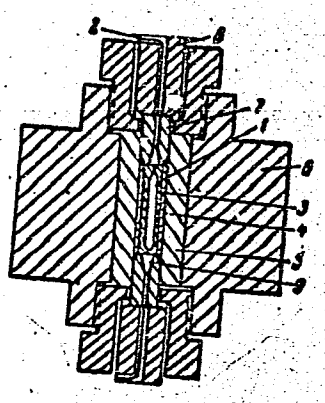

Fig. 1. Design of high-pressure chamber

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ACC NR: AR6019864 (N) SOURCE CODE: UR/0398/66/000/001/V013/V013

AUTHOR: Sokolov, B. K.

TITLE: The influence of certain operational factors on the wear rate of engine cylinder liners

SOURCE: Ref. zh. Vodnyy transport, Abs. 1V83

REF SOURCE: Tr. Leningr. in-ta vodn. transp., vyp. 82, 1965, 13-20

TOPIC TAGS: marine engine, engine component, wear resistance, engine crankshaft, engine cylinder, auxiliary ship, friction coefficient

ABSTRACT: Curves showing the wear rate for the cylinder liners in the starboard 6L275RR engines installed in the motorships Pamir, Khingan, and XXI S"yezd KPSS in the vicinity of the liners' I belt, those showing the annual change in cylinder liner wear rate in the latter two ships, as well as wear rate distribution curves for the cylinder liners in the 6-8NVD-48 engines installed in diesel tugs assigned to the Volga Tanker Steamship Line when operating at differing crankshaft rpm, and the curves for the relationship between the coefficient of friction and crankshaft rpm and change in cylinder liner wear rate in the I belt of the Ch10.5/13 engine on crankshaft rpm, are presented. The investigations established the fact that every

Card 1/2 UDC: 621.431.74-222.004.6

ACC NR: AR6019864

engine type has an optimum crankshaft rpm rating at which the cylinder liner wear rate in the I belt is lowest. 5 figures, 2 tables. Bibliography of 6 titles. [Translation of abstract]

SUB CODE: 21,13

Card 2/2

SOKOLOV, B.L.

One of the important tasks of the control organs of the Committee.
Izm.tekh.no.2:55-57 Mr-Ap '56. (MLRA 9:7)
(Measuring instruments--Testing)

SOV/120-58-2-32/37

AUTHORS: Bondarenko, R.N., Strikha, V.I., Sokolov, B.L.

TITLE: Screening of the Slit of a Measuring Waveguide for the Decimeter Range (Ekranirovaniye shcheli izmeritel'noy linii detsimetrovogo diapazona)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1958, Nr 2, pp 109-110 (USSR)

ABSTRACT: It is shown that, in work with industrial coaxial measuring lines designed for the decimeter range, the distribution of the electromagnetic field may be distorted when electromagnetic interference is present. The line IL-D is considered. A method for screening the slit of the measuring line is described. The screening device consists of a metallic band attached to the body of the line and covering the slit, two pulling drums with springs, and special guides which fix the position of the ribbon relative to the probe of the measuring line. An aperture is drilled at the centre of the metallic band and the probe is inserted through this aperture. Fig.1 shows the distribution of the electromagnetic waves along the line without the screening attachment, and Fig.5 shows the improved pattern obtained with a screened slit. The accuracy of measurement is

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Screening of the Slit of a Measuring Waveguide for the Decimeter Range.

thus clearly improved and the line can be used for small incident power. Thus for example the distribution shown in Fig.5 was obtained with $\lambda = 60$ cm and $W = 4 \times 10^{-6}$ watt. There are 5 figures, no tables or references.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet (Kiyev State University)

SUBMITTED: June 24, 1957.

1. Waveguide slots--Equipment 2. Electromagnetic waves--Control 3. Electromagnetic waves--Measurement

AUTHOR: Sokolov, B.L. SOV-115-58-3-38/41

TITLE: On the Repair of Stanlard Measures and Instruments (O remonte obraztsovykh mer i priborov)

PERIODICAL: Izmeritel'naya tekhnika, 1958, Nr 3, p 100 (USSR)

ABSTRACT: The author states that the Institutes of the Komitet standartov, mer i izmeritel'nykh priborov (Committee of Standards, Measures and Measuring Devices) does not cope with the task of checking and repairing measuring instruments and devices coming from the state inspection laboratories. The "Etalon" plant in Riga was the only plant in the Committee system doing repair work on weight-piston manometers, but now it is subordinated to the Latvian Sovnarkhoz and does no repair work any more. The Institutes have failed do organize the repair of many measuring instruments in their own workshops, and usually seek contractors to do the work, practice transferring standard devices and in-

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struments into lower classes, despite the fact that this was forbidden by the Committee back in 1956.

1. Measurement equipment--Maintenance